

REMARKS

Applicants have amended independent claims 1, 14, and 33, and have canceled claims 25 to 27, 29, 43 and 44. Claims 2 to 6, 8 to 10, 15 to 18, 28, 30 to 32, 35, 36, 38 to 40, and 45 to 47 have been earlier cancelled. Accordingly, upon entry of this response, claims 1, 7, 11 to 14, 19 to 24, 33, 34, 37, 41 and 42 remain pending. Applicants now address each and every point raised by the Examiner in the above-identified Office action as follows:

I. Claim Rejection Under Section 112

Claims 1, 14, 25, 33 and 43 have been rejected under 35 U.S.C. §112, first paragraph. Applicants have amended these claims to address the issues noted by the Examiner and, in view thereof, respectfully request that the rejection of the claims under 35 U.S.C. §112, first paragraph, be reconsidered and withdrawn. Initially, claims 25 and 43 have been canceled, thereby obviating the rejection as to these claims. Applicants have canceled these claims to limit the invention embodiment that is being claims to the embodiment clearly consisting of only two material phases, namely, a hard phase and a binder alloy phase.

With respect to use of the term “consisting” as it relates to limiting the cermet to only a hard phase and a binder alloy phase, Applicants submit that although the specification does not expressly disclose that the cermet “consist” of only two phases, it is clear from the specification in its totality that invention embodiment that is the subject of the pending claims has only two phases (the hard phase and the binder alloy phase). While there is another invention embodiment disclosed in the specification that includes a third phase, Applicants submit that the portion of the specification defining the scope of the two-phase invention embodiment clearly does not suggest or imply the presence of another phase.

Applicants submit that for purposes of evaluating whether use of the term “consisting of” as it relates to limiting the cermet to the two phases is properly supported in the written description one must look at the specification in its totality and such support does not have to be expressed to be properly support, but can also be implied from the totality of the specification. Applicants submit that if the Examiner studies the specification with respect to the written description of the invention embodiment being claims, the Examiner will find and agree that the recital of a cermet

comprising only two phases (i.e., consisting of two phases) is properly implicitly supported by the totality of such invention embodiment written description. For this reason, Applicants believe that use of the term “consisting of” as recited in the claims with respect to the cermet material is properly supported by and meets that written description requirement under Section 112.

Applicants have amended independent claims 1, 14 and 33 to revise the term “consisting of” to “comprising” as it relates to the materials that are used to form the binder alloy.

In view of the above, Applicants respectfully request that the rejection under 35 U.S.C. §112, first paragraph, be reconsidered and withdrawn.

II. Claims Rejection Under Section 103 Based on Sue, JP’301 and Nakamura

Claims 1, 7, 11, 12, 14, and 19-21 have been rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Sue, in view of JP’301 and Nakamura. Applicants submit that the combination of the references noted by the examiner fails to render obvious the invention as recited in the rejected claims for the following reasons.

Applicants’ cermet material recited in independent claims 1 and 14 consists of two phases; namely, (1) a hard WC phase that is bonded with, (2) a low CTE binder alloy comprising Fe, Co, Ni, C and Mn, wherein the Co is present in the range of from 10 to 30 percent by weight of the total binder alloy. Applicants’ binder alloy is specifically engineered to provide coefficient of thermal expansion that closely matches that of the WC as quantified in the claims.

Sue discloses a composite construction having a first hard phase (comprising a cermet formed of WC-M, where M may be Co, Ni, Fe, W, Mo, Cu, Al, Nb, Ti, Ta, and alloys thereof, which is provided in the form of a core or sheet), and a second binder phase (formed from a material consisting of Co, Ni, Fe, W, Mo, Cu, Al, Nb, Ti, Ta, and alloys thereof, which is provided in the form of a shell or sheet disposed around or over the first phase). So in reality, Sue discloses a three-phase construction and not a two-phase construction.

Contrary to the Examiner’s position that Sue “reads on the cermet materials consisting of WC and binder alloy as recited in the instant claims, first off this only relates to a portion of the

Sue construction and not the total construction of sue that comprises three phases. Secondly, while the hard phase in Sue arguably comprises WC and a ductile metal, Sue fails to disclose that the ductile metal can be an alloy as Applicants' claimed binder alloy comprising Fe, Co, Ni, C and Mn. Sue simply fails to disclose that the ductile metal used with WC to form two of its three phases comprises blend where including C or Mn. This is a significant shortcoming in Sue, but it is not surprising that Sue fails to disclose or suggest the presence of such elements as Sue says nothing about matching the thermal expansion properties in its cermet first hard phase (of WC and M).

Two further shortcomings of Sue is one admitted by the Examiner; namely, that Sue fails to disclose or remotely suggest that the cermet material forming two of its three phases comprise: (1) 10 to 30 percent by weight binder alloy based on the total weight of the cermet material, and (2) that the binder alloy in the cermet first phase comprises 10 to 30 percent by weight Co.

Thus, the summary shortcomings of Sue is that: (1) it discloses a construction comprising 3 phases (not one consisting of two phases); (2) the ductile metal disclosed in Sue for forming the cermet material does not include the binder alloy as recited in Applicants' claims (i.e., does not include C and Mn); (3) if fails to disclose 10 to 30 percent by weight of the binder alloy based on the total weight of the cermet material; and (4) it fails to disclose that the cermet material comprise 10 to 30 percent by weight Co. These are four significant shortcomings that clearly render Sue alone incapable of rendering Applicants' cermet composition obvious or unpatentable as recited in independent claims 1 and 14.

The Examiner relies on JP '301 for its disclosure of a sintered article formed by combining a Super Invar powder with a ceramic powder. As earlier noted by the Examiner, JP '301 does not expressly disclose the use of WC. Additionally, the Super Invar powder disclosed in JP '301 (as set forth in Table 1) has a material composition that includes a unique combination of elements present in a particular amount; namely, 0.02 wt% C, 0.03 wt% Si, 0.15 wt% Mn, 0.005 wt% S, 0.001 wt% Cu, 31.83wt % Ni, 0.03 wt% Cr, 0.01 wt% Mo, and 5.0 wt% Co. Though not expressly disclosed in JP'301, for purposes of addressing this reference the remaining amount will be considered to be Fe.

In addition to JP'301's failure to disclose WC, JP'301 also fails to disclose a binder alloy comprising 10 to 30 percent by weight Co. The Super Invar of JP'310 comprises only 5 wt% Co.

The Examiner then asserts that JP'301 discloses that its sintered article can be used in power machine parts, an electronic device and measuring equipment such as IC boards, then relies on this intended use to somehow tie the subject matter of JP'301 to that of Sue, which discloses no such analogous uses. The composite construction of Sue is intended to be used with subterranean drilling and mining tools that has no relation whatsoever to electronic devices, measuring equipment and IC boards. For this reason, Applicants submit JP'310 discloses subject matter that is not analogous to Sue, thus JP'301 is not properly combinable in the manner suggested by the Examiner.

Further, the Examiner next asserts that because of the alleged similarity in uses (that again is misplaced and does not exist), it would have been obvious for one having ordinary skill in the art to partially replace the Co binder of Sue with the Super Invar of JP'301. This position is improper on a number of levels. First, as noted above, Sue and JP'310 disclose nonanalogous subject matter. Second, why would one skilled in the art be motivated to only "partially" replace the Co binder of Sue with the Super Invar of JP'301, and not "completely" replace the Co binder of Sue with the Super Invar of JP'301, i.e., why supplement rather than supplant (or completely replace) the Co. Complete replacement would be more logical (for purposes of argument), since you are replacing one binder for another.

Applicants' submit that the only reason that the Examiner is asserting "partial" replacement of Co in Sue is because JP'301 fails to disclose or suggest a Super Invar material having 10 to 30 percent by weight Co. While this approach is very creative, it is not one that is supported by any amount of motivation or suggestion in either Sue or JP'301, and it submitted as being nothing more than an improper hindsight reconstruction as a way to arrive at Applicants' claimed amount of Co. As misplaced as this argument is, Applicants still submit that this still doesn't meet the recited feature of the Applicants' claims since Sue fails to disclose the amount of Co in its cermet phase. Thus, even the misplaced and improper partial combination as promoted by the Examiner does not meet this claim feature.

Thus, for all of the reasons noted above Applicants submit that its invention as recited in independent claims 1 and 14 are not rendered obvious or unpatentable based on the combination of Sue and JP'301.

Nakamura discloses a high-strength bonding tool comprising a shank, which tool is used for mounting a semiconductor device. While this subject matter may be related to that disclosed in JP'301, it is not analogous to the subject matter of Sue as evidenced by the difference in US and International Classifications. Thus, Applicants submit the Nakamura is not properly combinable with Sue for this reason.

Nakamura discloses that the tool comprises a polycrystalline diamond-coated cemented carbide as the tool material. The shank material for this particular embodiment may include metals, alloys, and cemented carbide particles that include W, or Invar and Super Invar alloys. Nakamura does not disclose that the shank material "consist of" only two material phases; namely, a WC phase and a binder alloy phase. Nakamura does disclose the Super Invar alloy as having the following compositions: 64% Fe; 31% Ni, 5% Co, 0.3 to 0.4% Mn, and 0.07% C.

As noted above, Nakamura does not disclose a cermet composition "consisting of" only of a WC phase and a binder alloy phase, i.e. Nakamura does not preclude the existence of additional material phases. Further, the Super Invar material disclosed in Nakamura includes an amount of Co (5%) that is outside of the range (10 to 30%) recited in Applicants' claims. Thus, like JP '310, Nakamura fails to disclose or remotely suggest a binder alloy having the particular Co content (10 to 30 weight percent) as recited in the pending claims.

Thus, combining JP '301 with Nakamura at most would yield a composition comprising WC as one phase (adding WC from Nakamura to replace the ceramic powder in JP '310) with the Super Invar (from Nakamura) as another phase. However, even this hypothetical combination outcome fails to provide a cermet composition (as recited in Applicants' claims) having a binder alloy phase that includes 10 to 30 percent by weight Co. This is neither disclosed nor suggested in either reference, so their combination cannot operate to provide motivation or suggestion for such claim feature that is missing in each.

Thus, for all of the reasons presented above, Applicants submit that one skilled in the art taking Su, JP '310 and Nakamura would not be motivated to make its low CTE cermet composition as recited in independent claims 1 and 14, and for this reason the invention as recited in these claims is not obvious and is properly patentable over these combined references. Applicants, therefore, respectfully request that the rejection of independent claims 1 and 14, and the noted claims depending respectively therefrom, under 35 U.S.C. § 103(a) be reconsidered and withdrawn.

III. Claims Rejection Under Section 103 Based on Sue, JP'301, Nakamura and JP'547

Claims 13, 25 to 27, 29, 33, 34, 37, and 41 to 44 have been rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Sue, in view of JP'301, Nakamura and JP'547. Applicants submit that the combination of the references noted by the examiner fails to render obvious the invention as recited in the rejected claims for the following reasons.

Independent claims 25 and 43, and claims 25 to 27, 29, 43 and 44 have been canceled, thus obviating the rejection as to these claims. Therefore, this rejection only applied to claims 13, 33, 34 and 37. Independent claims 14 and 33 recite the claim features noted above in Section 2 of this response. Applicants submit that the subject of these independent claims is properly patentable and nonobvious over the combination of Sue, in view of JP'301, Nakamura for the reasons presented in Section 2 above.

JP '547 discloses a contact tool having a main body tool joined to a shank by a soldering material. This tool is useful for bonding an IC chip. Again, as noted above with respect to JP'301 and Nakamura, JP'547 discloses subject matter that is not analogous to the subject matter of Sue, and for this reason is not properly combinable therewith.

The main body tool of JP'547 has a base made from 90 to 98 percent by weight WC with Co. The Examiner relies on the further combination of JP '547 as motivation for replacing the ceramic powder of JP '301 with WC, and replacing the Co in JP '547 with the Super Invar disclosed in JP '301 and/or Nakamura. This is nothing more than a hindsight reconstruction as nothing in these references provides motivation that would support such a creative mixing and matching of invention features.

Further, none of these combined references disclose or remotely suggest the claim feature of the binder alloy comprising 10 to 30 percent by weight Co, which feature is present in each of Applicants' independent claims 14 and 33.

Thus, for the reasons presented above, Applicants submit that one having ordinary skill in the art aware of each of the noted references, and taking these references in combination, would not be motivated to produce the invention comprising the invention features as recited in Applicants' independent claims 14 and 33. Accordingly, Applicants respectfully request that the rejection of independent claim 33 and the claims depending therefrom and from independent claim 14 under 35 U.S.C. § 103(a) be reconsidered and withdrawn.

IV. Request for Telephone Interview

Should the Examiner believe that the claims now pending in this patent application are not in proper condition for allowance after consideration of this response, Applicants respectfully request that the Examiner please contact its below-designated patent attorney for the purpose of conducting a telephone interview to discuss any remaining issues.

The proceedings herein are for a patent application and the provisions of 37 C.F.R. 1.136 apply. The Commissioner is authorized to charge any underpayment of fees, and to credit any overpayment of fees due, including extension of time fees, to Deposit Account No. 50-3683.

Respectfully submitted,

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